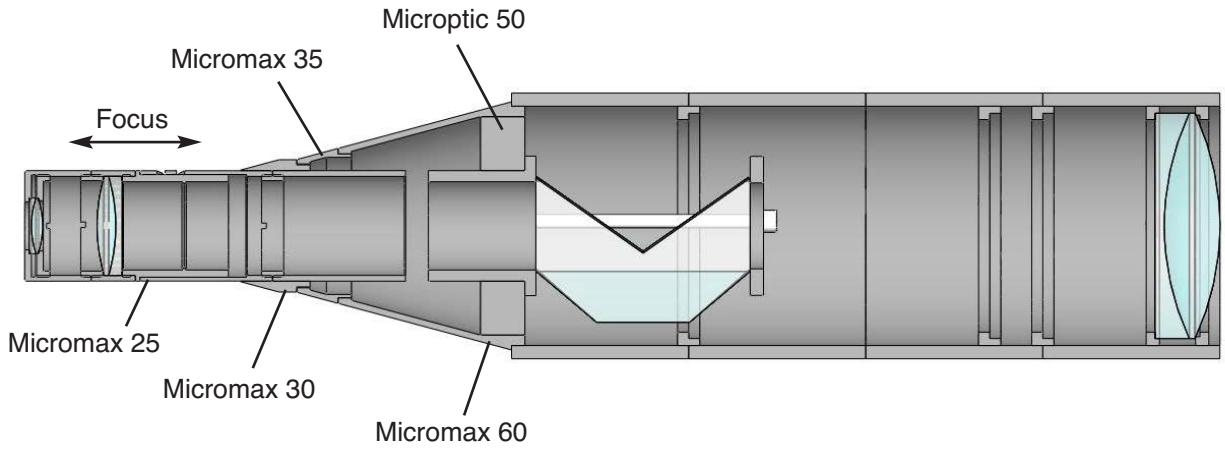
Optoform

Micromax System 25, 30, 60

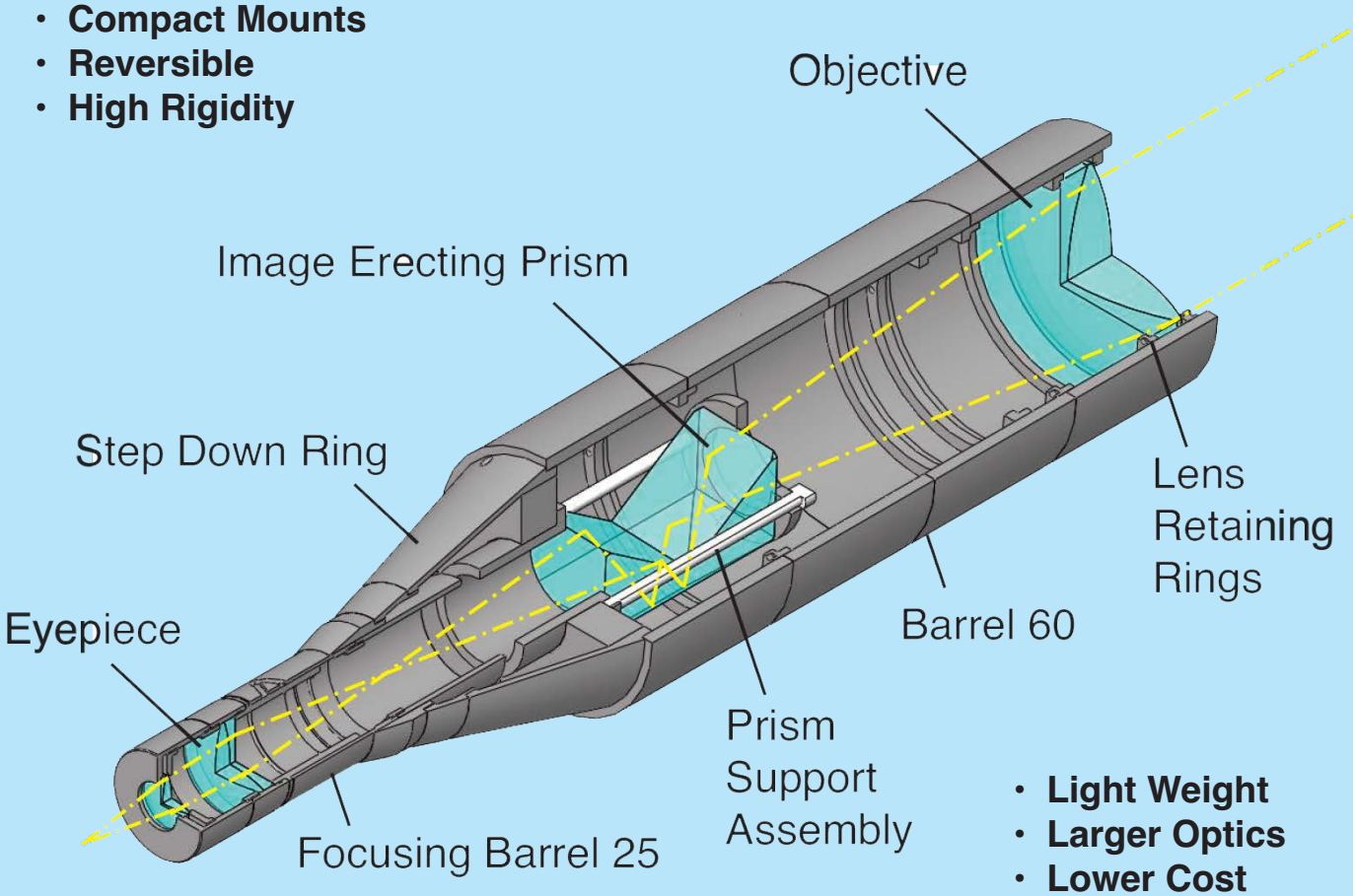
How to use Micromax

Build without limits

Micromax Applications



- **Compact Mounts**
- **Reversible**
- **High Rigidity**



- **Light Weight**
- **Larger Optics**
- **Lower Cost**

Be Different. Think Different. Do it with Taste. Make it a Better Product

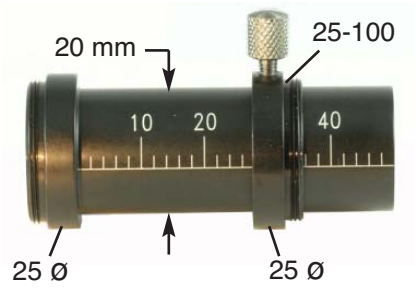
Micromax 25

25-100 Standard Mount 25

Secures 20 mm accessories via a M3 set screw, at end of 25mm tubes with M 23.4x0.75 thread. May be mounted to sphere 25-116 to secure 45° mirror mounts.

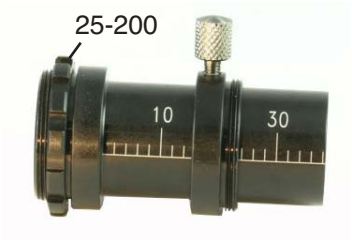
25-106 Focusing Mount

Designed to provide positional adjustment between two tubes, or a mounted optics cell and a tube. Graduated in mm, 45 mm adjustment.



25-108 Focusing Mount

Identical to 25-106 but with retaining ring 25-200 that allows locking the graduated tube at any angle, i.e., when-mounting to sphere 25-116. 35 mm adjustment.

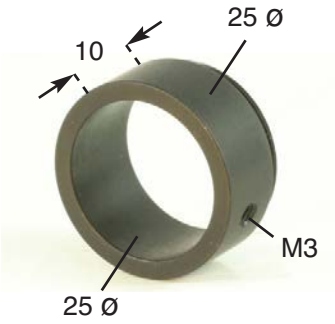


25-110 Focusing Mount

Identical to 25-108 but with 20 mm positional adjustment. Graduated in mm markings.

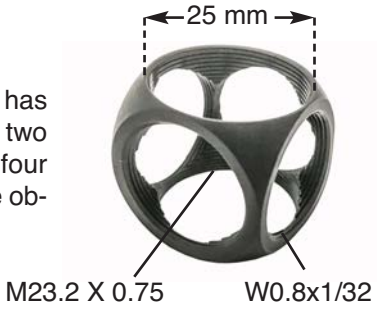
25-112 Long Mount 25

Identical to 25-100 but with a 10 mm long barrel for wobble free focusing action inside the mount. Both mounts can also secure 25-337 elliptical mirror mount, and other accessories.



25-116 Sphere 25

25X25X25 mm sphere has M23.4X0.75 thread on two of its openings, and four W0.8x1/32 microscope objective threaded faces.



25-117 End Cap 25

For sealing unused sides of Sphere 25 or open ends of Micromax tubes with standard thread size 23.2 X 0.75

25-117S End Cap 25

For sealing unused sides of Sphere 25 or open objective bores of microscope turrets with thread size W0.8x1/32

25-118-130 Support Tubes
L = 6 ~ 50 mm

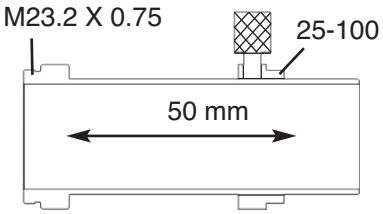
Tubes are for constructing optical tubes, i.e., acting as a spacer between two optical elements with standard thread M23.2 X 0.75, For adjustable tube length, focusing tubes 25-106/108/110 are utilized.

Part No.	Length
25-118	**L = 6**
25-120	L = 10
25-122	**L = 15**
25-124	L = 20
25-126	**L = 25**
25-128	L = 30
25-130	**L = 50**

How Miocromax Works

Micromax concept follows a simple idea but it can only be implemented if there is standardized threaded lens cells, and support tubes. We use the standard Microbench thread 23.2X0.75 employed in all their 25 mm lens cells, and accessories.

To build a small telescope, for example, tubes, eyepiece holder, and mounted objective lens cells are screwed together as desired. The eyepiece holder in this case allows focusing adjustment for the eyepiece. Note the orientation of Achromats in their 25 mm lens cells: The threaded mount for longer lens (i.e., f = 140) is oriented towards the eyepiece, allowing its direct mounting to 25 mm tubes for constructing telescopes. The threaded end for shorter Achromats (i.e., f = 40) are oriented away from the eyepiece, more for close focus applications. Micromax system consists of 130 holders, and accessories all of which are either directly compatible or step up/down rings may be utilized to interconnect them.



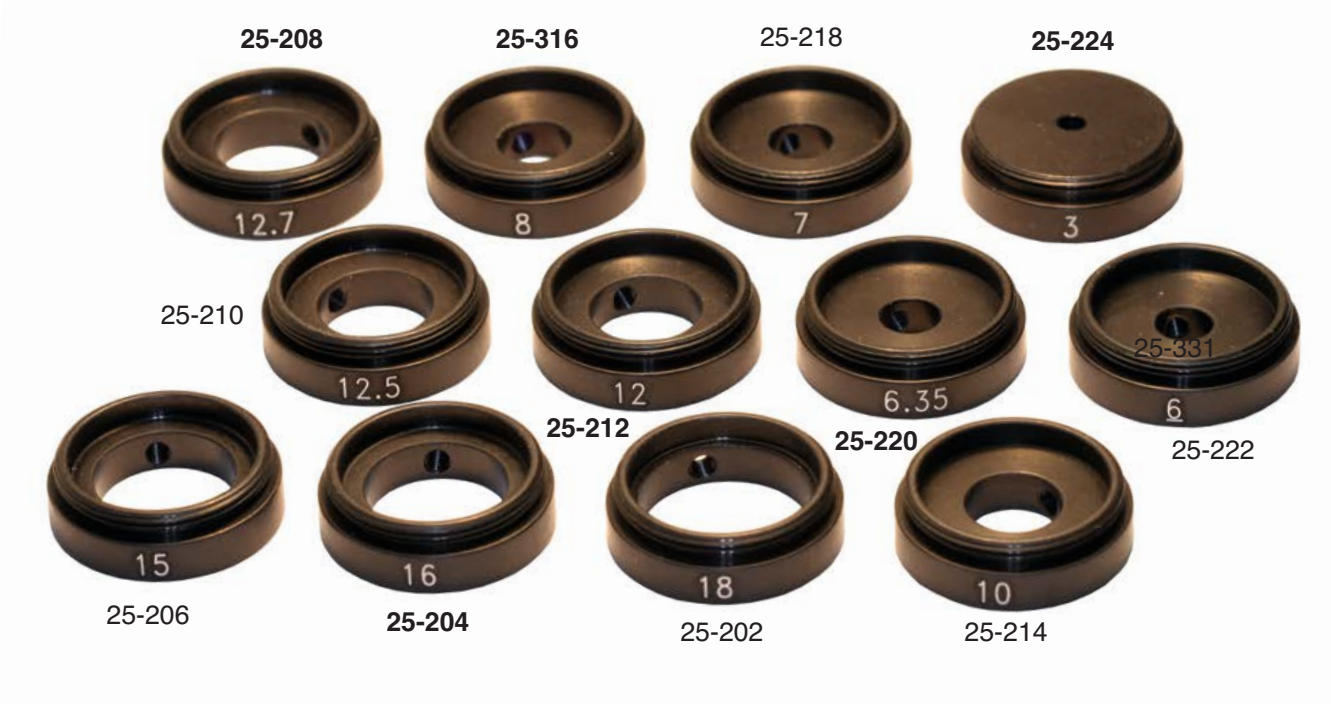
25-106

25-108

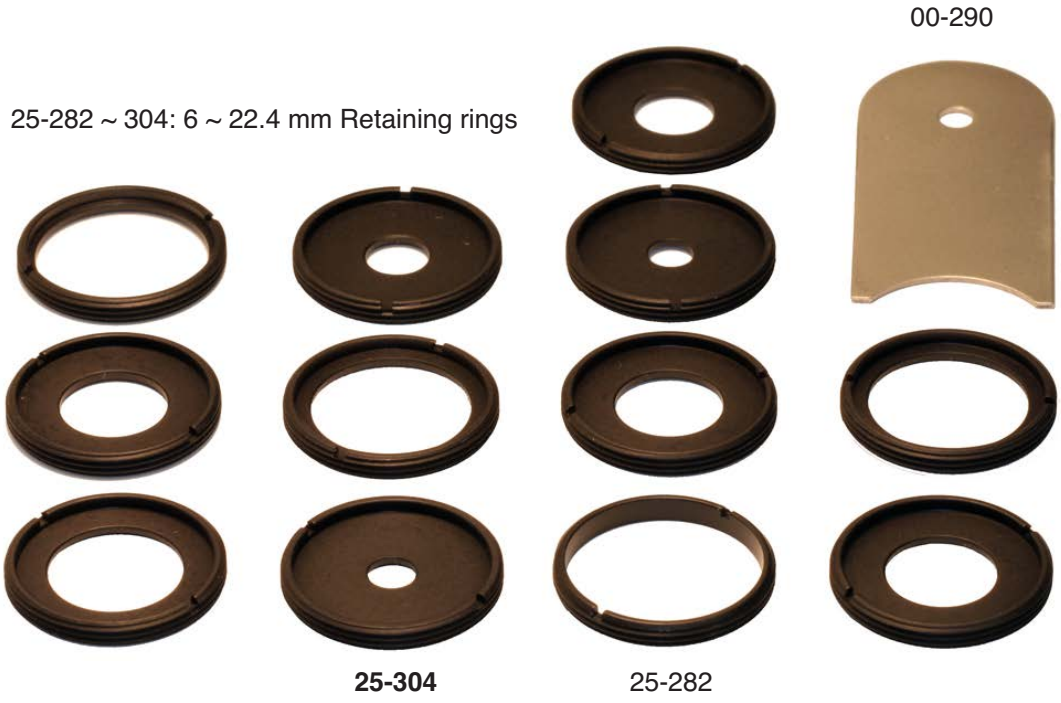
Above, combining Micromax 30 with Micromax 25 components to construct a short telescope. Right, a compact telescope built with Micromax 25/30.

Holders 3 ~ 20 mm

For securing cylindrical accessories at one end of Micomax tubing, with standard thread M23.2 X 0.75. The 3 mm holder may be suitable to secure a fiber bundle for illumination. The 12.7 mm might be utilized to secure a 1/2" laser pointer. The bore diameters could easily be enlarged under a drill press to custom sizes.



25-100	**Holder 20 mm**	25-214	Holder 10 mm
25-202	Holder 18 mm	**25-216**	**Holder 8 mm**
25-204	**Holder 16 mm**	25-218	Holder 7 mm
25-206	Holder 15 mm	**25-220**	**Holder 6.35 (1/4")**
25-208	**Holder 12.7 (½")**	25-222	Holder 6 mm
25-210	Holder 12.5 mm	**25-224**	**Holder 3 mm**
25-212	**Holder 12 mm**		



Lens Mounts 6 ~ 22.2 mm

Tubes for securing optical elements such as singlets or achromats. All our lens mounts have the same M23.2 X 0.75 thread so the could be added onto end of tubing, or just combined together.

Mounting Optics

There is a matching set of retaining rings with standard thread M23.2 X 0.75 to allow mounting any length of cylindrical optical elements between 6 to 22.4 mm in diameter inside Micromax tubing. Normally, the clearance aperture is the diameter of the lens minus 1 mm.

25-254 Lens mount **22.4 mm**, L = 12
25-256 Lens mount 22.4 mm, L = 10
25-258 Lens mount **22.4 mm**, L = 6 mm

25-260 Lens mount 20 mm, L = 10
25-262 Lens mount **19 mm**
25-264 Lens mount 18 mm

25-266 Lens mount **15 mm**
25-268 Lens mount 12.7 mm
25-269 Corner cube mount **25/12.7 mm**

25-270 Lens mount 12.5 mm
25-272 Lens mount **12 mm**
25-274 Lens mount 10 mm

25-276 Lens mount **8 mm**
25-278 Lens mount 6.5 mm
25-280 Lens mount **6 mm**

25-282 Retaining ring 22.4, set of 2
25-284 Retaining ring **20 mm**, set of 2
25-286 Retaining ring 19 mm, set of 2

25-288 Retaining ring **18 mm**, set of 2
25-290 Retaining ring 15 mm, set of 2
25-292 Retaining ring **12.7 mm**, set of 2

25-294 Retaining ring 12.5 mm, set of 2
25-296 Retaining ring **12 mm**, set of 2
25-298 Retaining ring 10 mm, set of 2

25-300 Retaining ring **8 mm,** set of 2
25-302 Retaining ring 6.5 mm, set of 2
25-304 Retaining ring **6 mm**, set of 2

Connecting Rings / Holders

For securing optics / accessories in between or at one end of Micromax tubing, with standard thread M23.2 X 0.75. There is an adapter (25-320) to secure optoform assemblies to a phoropter, 25-331 accepts standard microscope objectives with W0.8x1/36 thread. Longer retaining ring 25-306 can be utilized to connect two or more tubes together.

25-226	**Blank Disc 25**
25-136	Side access tube L = 30
25-198	**Accessory holder 25**
25-200	Handling ring for polarizers, etc.
25-306	**Thick retaining ring 22.4 mm**
25-308	Interface ring 20 mm with M3 set screw
25-310	**Interface ring 12.7 mm (1/2") with M3 set screw**
25-312	Interface ring 3 mm with M3 set screw
25-314	**Connector ring 20 mm**
25-320	Phoropter adapter 19 mm
25-327	**Beamsplitter cube holder 12. 7 mm (1/2")**
25-331	Microscope objective holder W0.8x1/36
25-332	**Microscope thread adapter W0.8x1/36 to M23.2x0.75**
25-337	45 Deg. mirror mount 12.7 mm (1/2") in diameter
25-340	**45 Deg. mirror mount 20 mm in diameter**
25-344	Post mount end cap M6
25-346	**Post mount end cap ¼-20**
25-348	Support Plate 30 mm
25-350	**Support Plate 25 mm**
25-352	Beamsplitter holder 20, for beamsplitter 20-452, 12.8x18x2 mm
25-354	**Microscope eyepiece holder**
25-358	Microscope eyepiece adapter 23.2 mm
25-402	**C-mount adapter 30**

Side Views

25-332

25-331

25-320

25-402

25-308

25-314

25-202

25-320

25-100

25-269

25-280

25-110

25-226

25-224

25-202

25-402

25-332

25-218

25-354

25-312

Micromax 30

30-400 Standard Mount 30/25

For securing 25 mm lens cells at end of tubes with M28X0.8 Secures 45° mirror mounts inside sphere 30-416.

30-406 Tube 30 L = 6

Short tubing to add length to Micormax tubing with with M28X0.75 thread.

30-410 Lens Mount 25/25.4

For securing 25 mm or 1” lens cells with M28X0.8 via a retaining ring.

30-412 Lens Mount 25/25.4

For securing 25 mm or 1” lens cells with M28X0.8 via a retaining ring. Identical to 30-410 but for securing thicker optics such as achromats.

30-414 Tube 30 L = 10

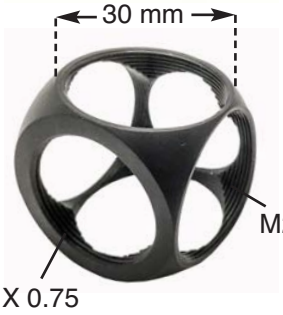
For securing 25 mm lens cells at end of tubes with M28X0.8

30-415 Tube 30 L = 15

For securing 25 mm lens cells at end of tubes with M28X0.8

30-416 Sphere 30

Connecting sphere for Micromax 30 tubes (M28X0.8) on its four faces. Other two faces accept Micromax 25 tubes or end caps (M23.2 X 0.75 thread).



30-417 End Cap 30

End cap with M28X0.8 thread.

30-418 Tube 30 L = 20

20 mm long Micromax tubing with M28X0.8 thread.

30-420 Tube 30 L = 25

30 mm long Micromax tubing with M28X0.8 thread.

30-422 Reducing Adapter 30/25

For connecting Micromax 25 mounting rings (M23.2X0.75) to Micromax 30 (M28X0.8)

30-424 Retaining ring 25

For securing 25 mm lenses inside tubes with M28X0.8

30-425 Retaining ring 25.4

For securing 25.4 mm lenses inside tubes with M28X0.8

30-426 extended Retaining ring 25

For connecting 30 mm tubes together with M28X0.75 thread.

Breadboard and Stage Mounting

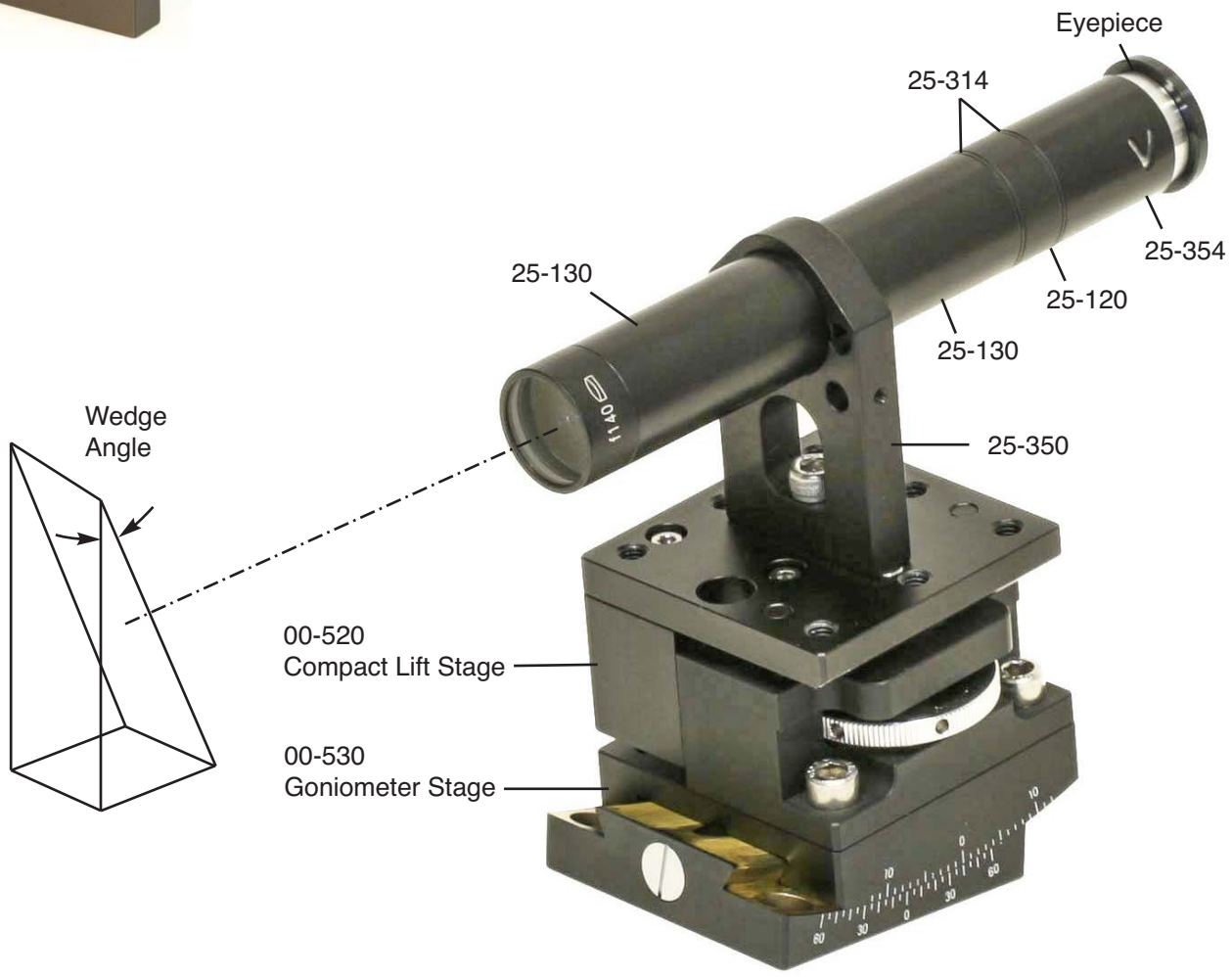
25-348 Support Column 30

For securing micromax 30 on mechanical stages or bread-boards / optical tables.

25-350 Support Column 25

For securing micromax 25 on mechanical stages or bread-boards / optical tables.

The clearane hole allows insertion of inch or metric allen screws for direct mounting via a ball driver wrench.



Interfacing Micromax assemblies on top of translation stages via support column 25-348, and 25-350. The mounting scheme is rigid, and repeatable. In this example, a tilt mount is stacked with a Z-stage to setup a prism wedge angle measuring stage.

30-428 extended Retaining ring 25 with internal thread

Same as 30-426 but with internal thread M23.2x0.75 to accept Micromax 25 retaining rings, and other accessories.

50-337 45 Deg. Adjustable Mirror mount

Can secure an elliptical mirror inside sphere 30-416

30-430 Tube 30, L = 50

Has internal thread M28X0.8, to be an extention tube or to house mutiple lens elements via retaining rings 30-424. Smaller lenses can also be mounted in 25 mm lens cells.

30-432 Tube 30 with Side Access, L = 50

Has M28X0.8 thread, and 25 mm side access through bore. It can secure tubes by friction, i.e., for eliminat ing stray light in folded optics.

30-438 Conic Reducing Ring 30/25

For securing 25 mm tubing at end of 30 mm tubes for focusing.

30-436 Mitutoyo Adapter

For mounting Mitutoyo thread objectives at end of Micromax 30 tubing.

30-450 End Cap 30

Identical to 30-117 but has flat end (without wrench slot) for sealing end of tubes.

30-452 Connector Ring 25

For securing 25 mm optics in between two Micromax 30 tubes. With M3 side screw to secure optics.

35-454 Connector Ring 25.4

Identical to 30-452 but for 25.4 mm (1 inch) components.

30-422 Reducing adapter **M28x0.8 to M23.2x0.75**
30-424 Retaining ring 25 mm, set of 2
30-425 Retaining ring **25.4 mm**, set of 2

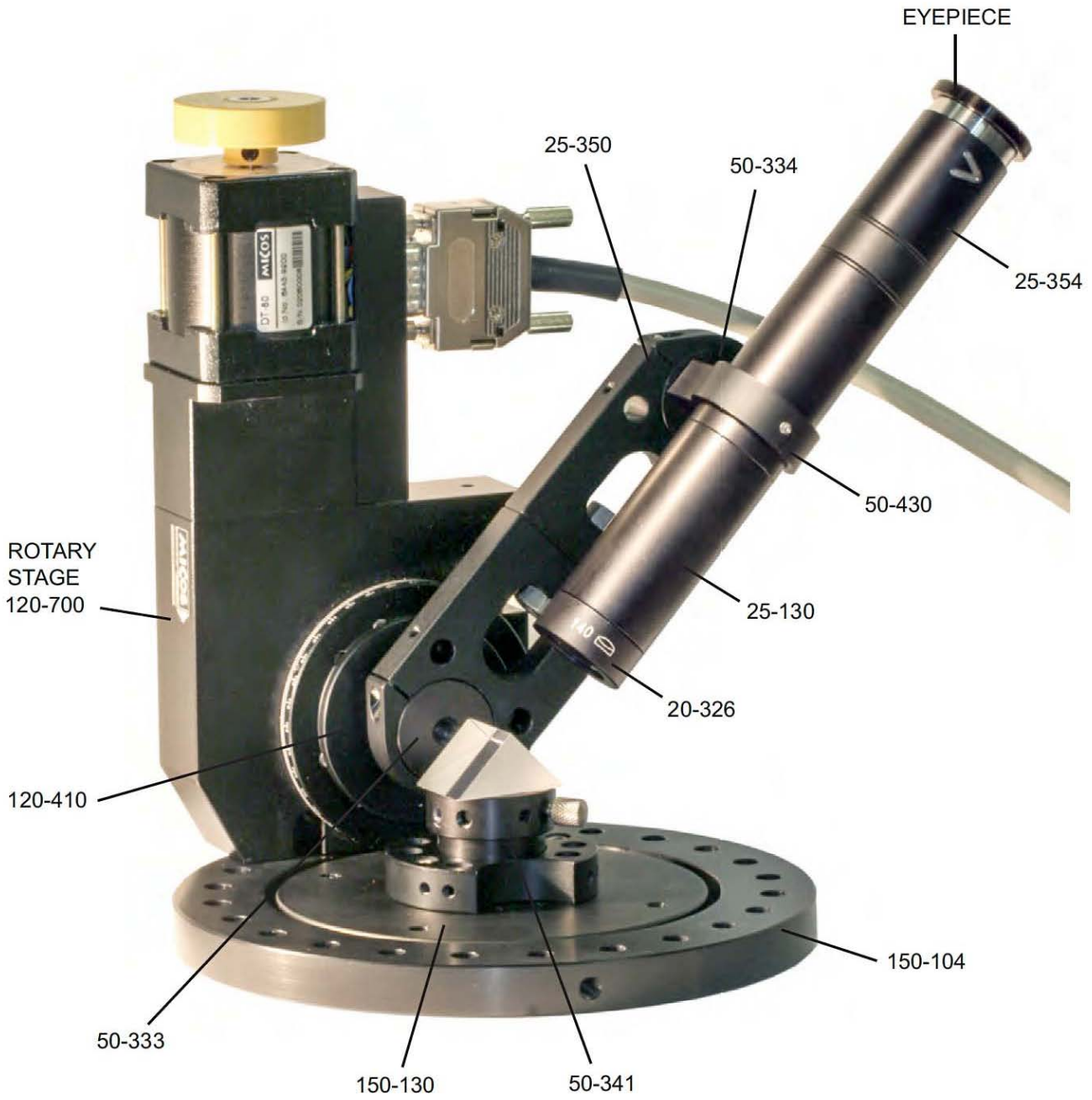
30-426 Thick retaining ring M28x0.8
30-428 Thick retaining ring **M28x0.8** with **M23.2 x0.75** thread
30-430 Extension tube L = 50 mm

30-432 Tube 30 **L = 50 mm** with 25 mm cross bore
30-436 Mitutoyo objective/Thorlabs adapter
30-438 Conic reducing ring **30/25** for focusing

30-450 End cap 30 without wrench slit
30-452 Connector ring **30/25** L = 9 mm with M3 side set screw
30-454 Connector ring 30/25.4 L = 9 mm with M3 side screw

More advanced setups with Micromax

A motorized version of wedge angle measuring setup is shown below. It utilizes two 25-350 mounting columns back to back to link the micromax telescope to a motorized stage. Normally, so many parts are needed to accomplish this task but like it's shown, it can all be done with off-the-shelf components without the need to do any machining. Not that we discourage machining (Optoform components are so easy to secure by a lathe chuck) but the time it takes to set up a milling machine is not very reasonable at times. Opto-Mechanics is an exact discipline, and set up time for machining parts is really time consuming. In Optoform, each part is designed for its combined use with the rest of other parts in the system.



Mounting to Existing Instrumentation

50-170, 50-306/308 End Plates for Micromax 25/30

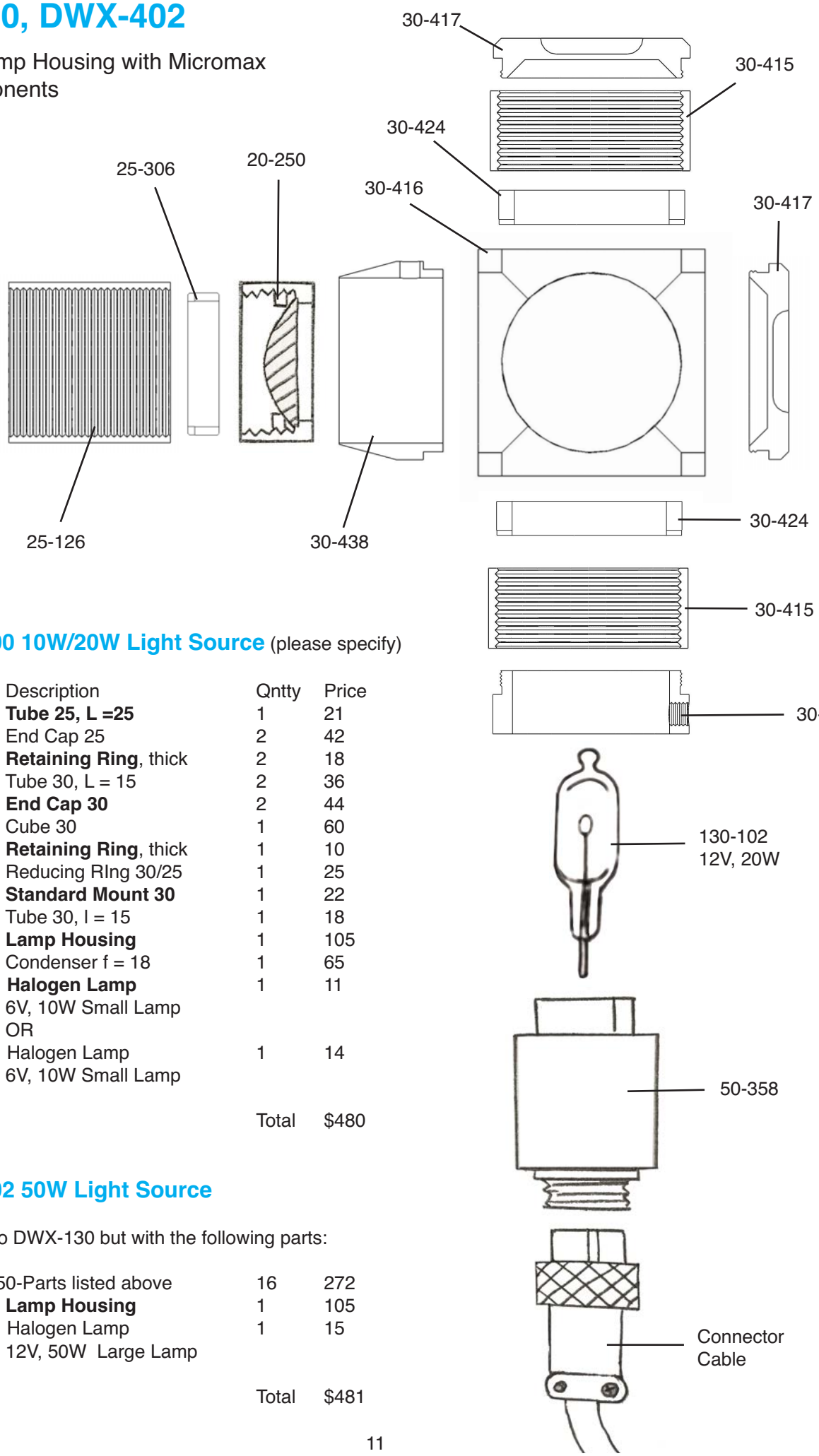
Micromax mounts 25, and 30 may be secured to various instruments, i.e., by utilizing 50-170 or cylindrical mounting interface utilizing 50-306 or 50-308. See pages 12 and 13 for practical hints.

50-170

50-306

DWX-400, DWX-402

Compact Lamp Housing with Micromax 25/30 components



DWX-400 10W/20W Light Source (please specify)

Part No	Description	Qntty	Price
25-126	**Tube 25, L =25**	1	21
25-117	End Cap 25	2	42
25-306	**Retaining Ring**, thick	2	18
30-415	Tube 30, L = 15	2	36
30-417	**End Cap 30**	2	44
30-416	Cube 30	1	60
30-424	**Retaining Ring**, thick	1	10
30-438	Reducing RIng 30/25	1	25
30-400	**Standard Mount 30**	1	22
30-416	Tube 30, l = 15	1	18
50-358	**Lamp Housing**	1	105
20-250	Condenser f = 18	1	65
130-100	**Halogen Lamp** 6V, 10W Small Lamp OR	1	11
130-102	Halogen Lamp 6V, 10W Small Lamp	1	14
		Total	$480

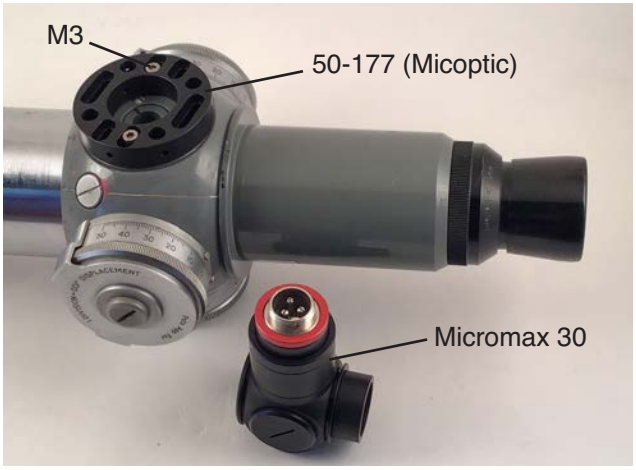
DWX-402 50W Light Source

Identical to DWX-130 but with the following parts:

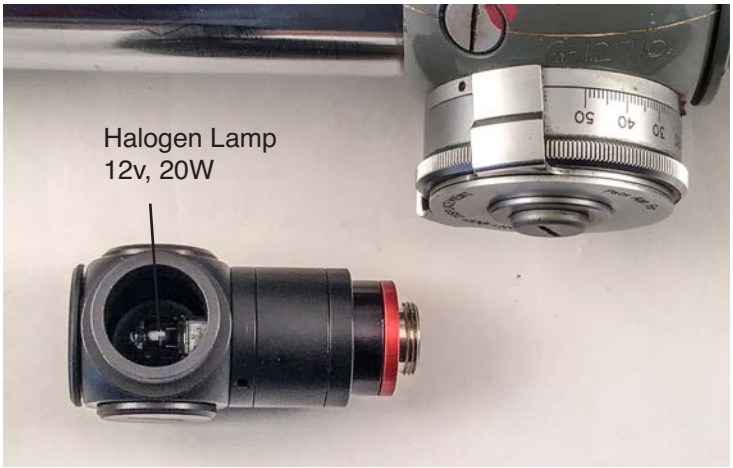
20/25/30/50-Parts listed above		16	272
50-359	**Lamp Housing**	1	105
130-108	Halogen Lamp 12V, 50W Large Lamp	1	15
		Total	$481

Design Example 1: Compact Lamp Housing with Micromax

Micromax so useful in repairing vintage optical instruments by upgrading their missing parts with new off the shelf components. One of the most common applications of micromax is its readiness to provide compact illumination for instrumentation that are missing parts. Three examples are given here to show how Micromax can be utilized in constructing a compact, self contained attachment to provide flexible illumination with various lamp types to choose from.



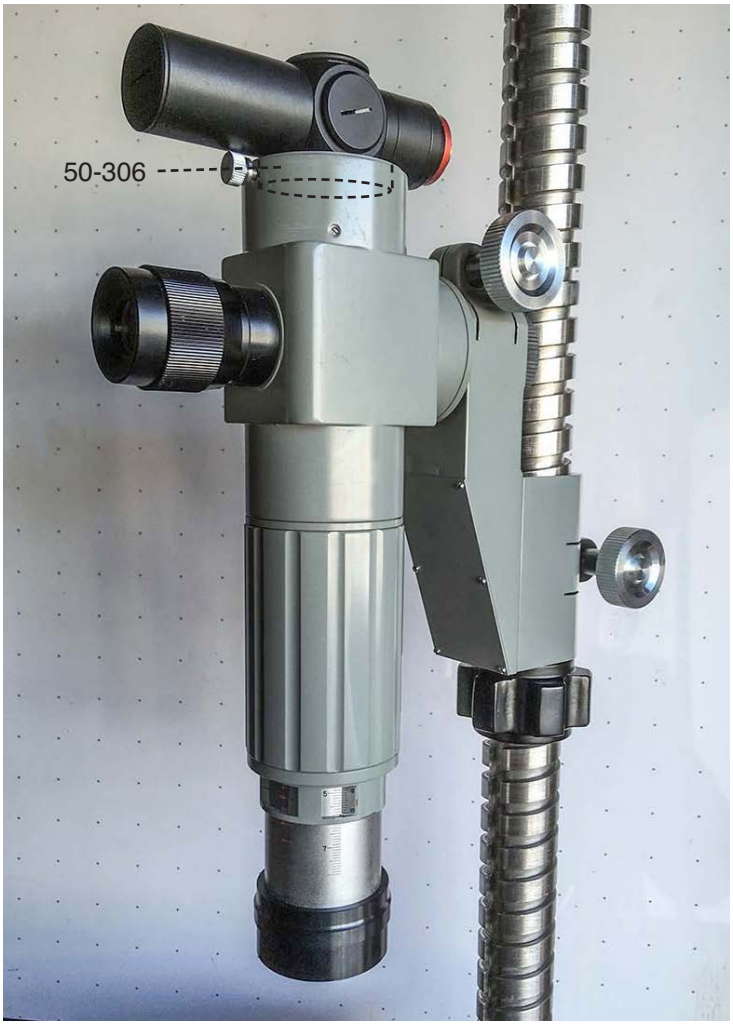
Tailor Hubson alignment telescope equipped with Micromax illumination module for reticule illumination. Micromax's compact design blends so well with the alignment telescope as it were the original light source by the manufacturer.



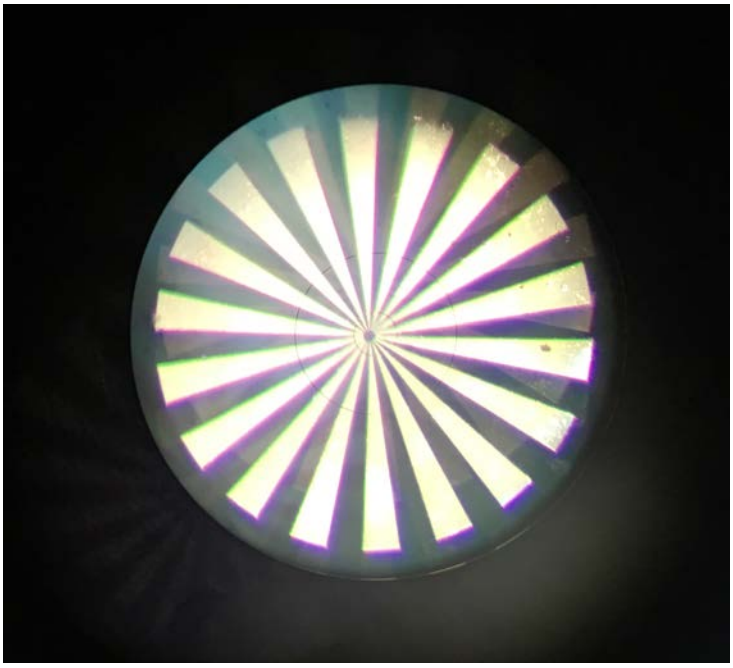
Above, details of Micromax attachment to the telescope are shown. The most commonly utilized adapter plate is Microptic shift mount 50-177. The horizontal bore pattern in this mount allows its mounting to various bolt patterns.

Tailor Hubson alignment telescope goes back over 70 years in its use in optical alignment. The internal focusing mechanism, (left) allows focusing from infinity down to its front window to perform opto-mechanical alignments in a system.

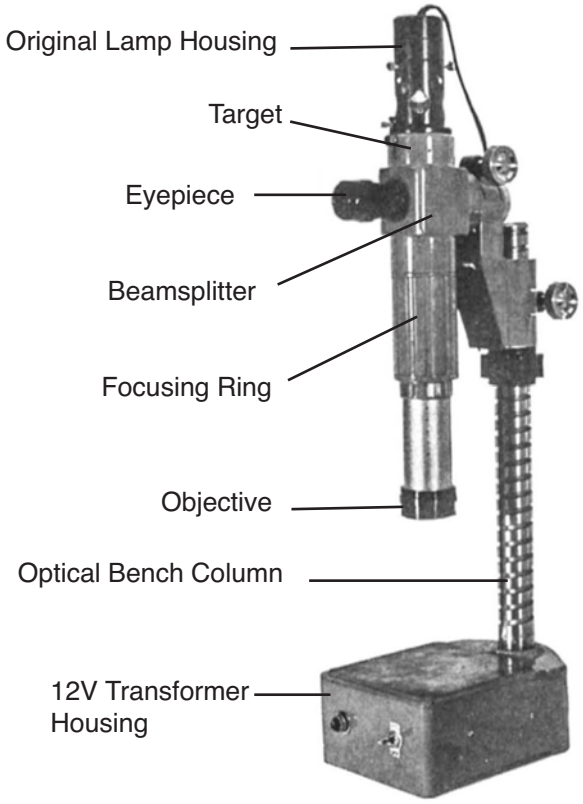
Pearl Autocollimator is another vintage instrument that in this case was missing a light source. A compact Micromax illumination housing was constructed for this instrument, and was secured on top of the collimator using its own lamp securing thumb screw. The interface plate in this case was Microptic End Plate 306. The outside diameter of this mount can easily be machined down in a lathe to exactly match the seating bore of the original lamp housing.



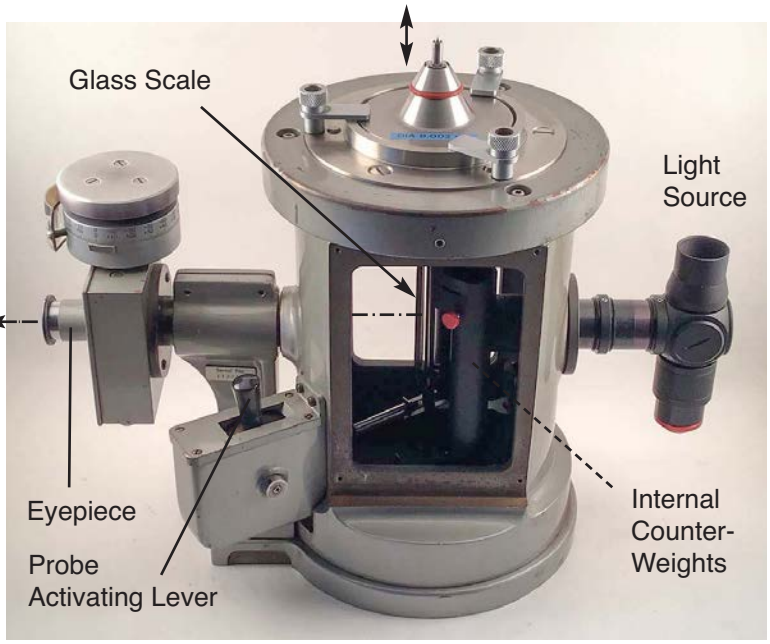
The illumination source for Pearl autocollimator is constructed with Micromax 30. The longer lamp enclosure is achieved by utilizing longer Micromax tubing 25-136 with side access hole for high heat dissipation from Halogen lamp.



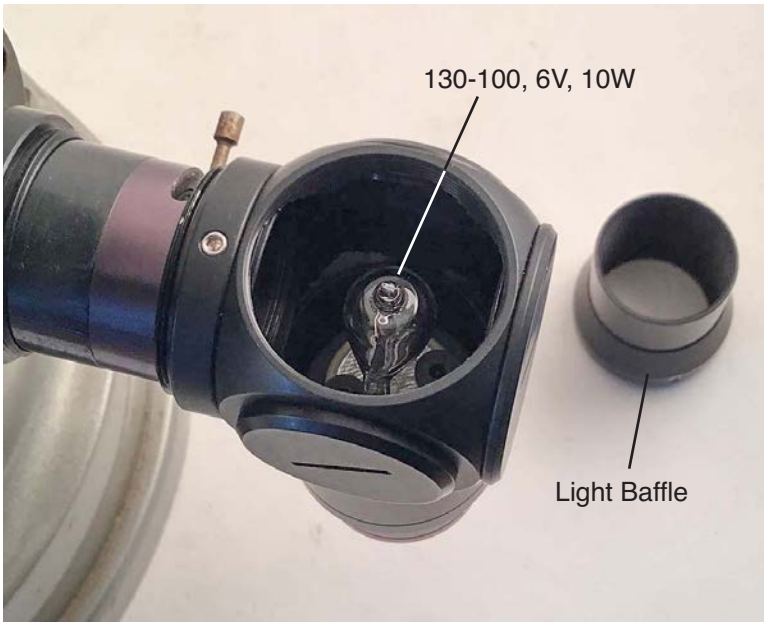
Star target in Pearl autocollimator is utilized to check both infinity focus in SLR lenses, and to check for paralellism between the sensor plane, and the lens seating flange. Right, the 12V power supply transofrmer is fitted inside the base.



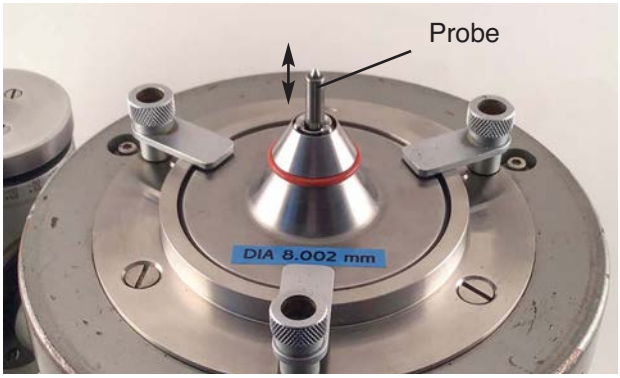
Gaertner Spherometer utilizes two internal weights to counter-balance its central probe's weight to land on the lens surface with virtually zero force. It accepts interchangeable lens measuring adapters (bottom of page) for performing measurements on various diameter lenses. An illuminated 0.01 mm graduated scale is viewed by its optical microscope for precise measurements. The central probe has a 50 mm travel range, and the lower portion of the probe exits the housing during measurements, and the instrument will not function without its support legs (not shown).

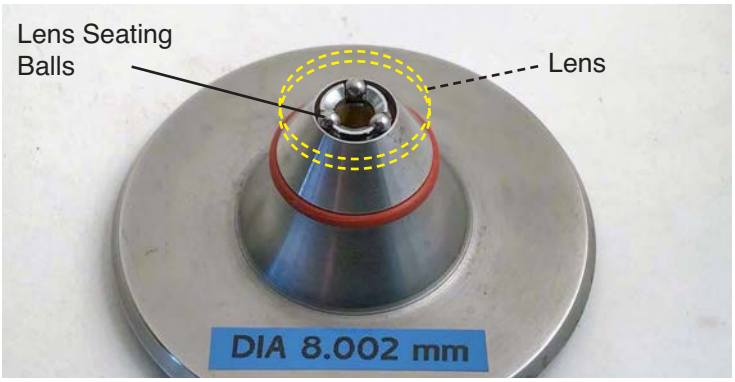


Micromax illumination attachment saves the day because this unit was originally missing a light source. This measurement scheme is still in use today but the scale has been replaced with a linear scale.



Micromax assembly naturally fits the metric flange of this instrument. A 10W Halogen lamp supplies ample illumination behind the vertical traveling transparent scale. Above right, both cover panels removed to reveal internal light path.





Micromax 60

60-408 Standard Mount 60 L = 12

For securing up to 50.8 mm optical elements within Micromax with M54x0.8 thread. Micromax 60 thread is identical to Minioptic lens mount 100-242, and 100-244.

60-424 Tube 50.8

For securing 50.8 mm optics. Package of 2. Each ring is marked “50.8” for easy indentification. Two drilled spanner recessions allow tightenning them to desired torque. 48 mm clearance aperture.

60-422 Retaining Ring 50

For securing 50 mm optics. Package of 2. Each ring is marked “50” for easy indentification. Two drilled spanner recessions allow tightenning them to desired torque. 48 mm clearance aperture.

60-428 Retaining Ring 40

For securing 40 mm optics. Package of 2. Each ring is marked “40” for easy indentification. Two drilled spanner recessions allow tightenning them to desired torque. 48 mm clearance aperture.

30-426 Thick Retaining Ring

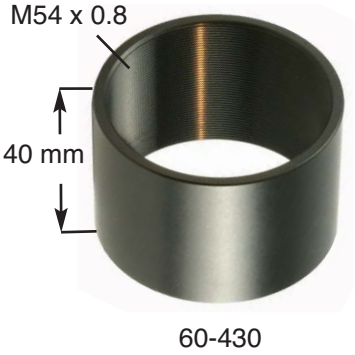
For connecting two 60 mm tubes together with M54x0.8 thread. Two drilled spanner recessions allow tightenning them to desired torque. 48 mm clearance aperture.

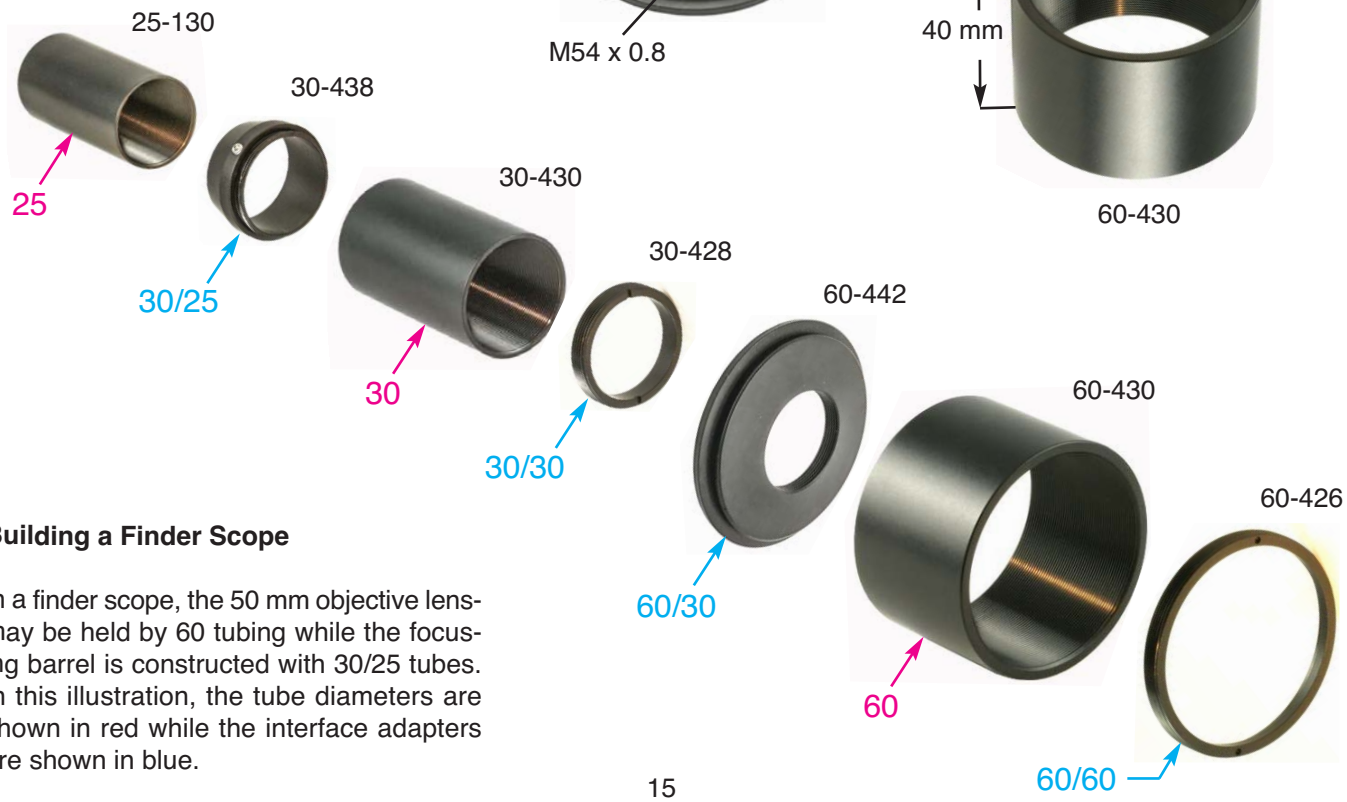
30-430 Tube 60 L = 40

For securing up to 50.8 mm optical elements. May be added together via 60-426 thick retaining rings.

60-442 Reducing Ring 60/30

Reducing ring to connect Micromax 60 to Micromax 30.





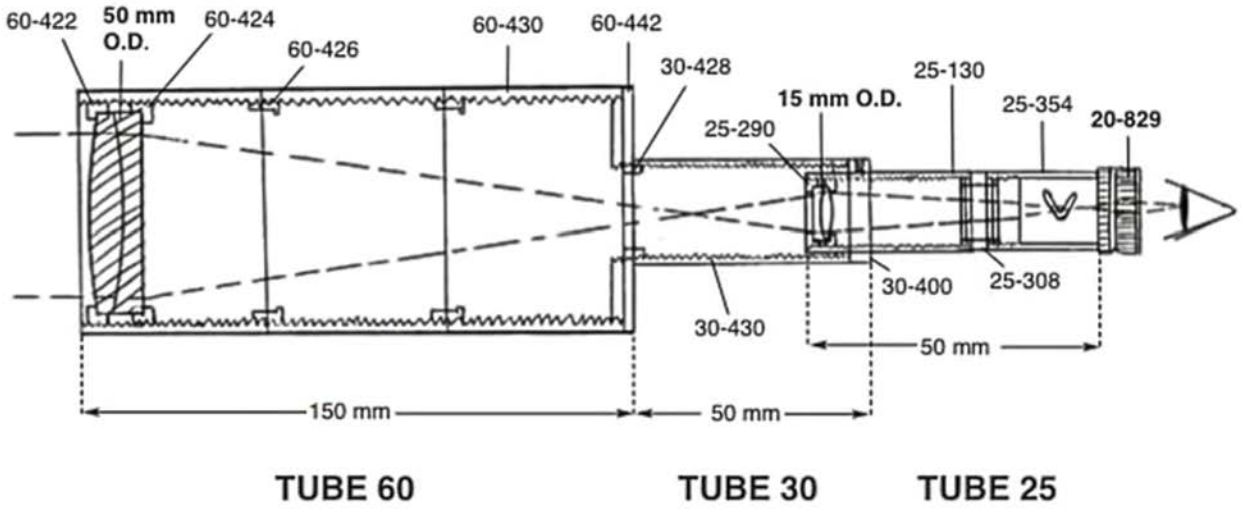
Building a Finder Scope

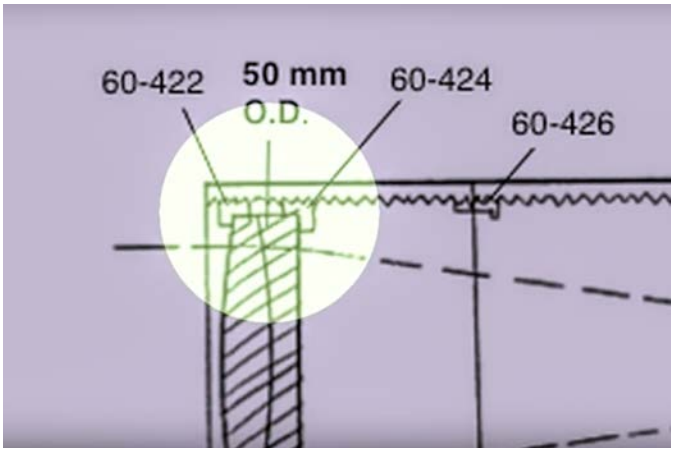
In a finder scope, the 50 mm objective lens-may be held by 60 tubing while the focusing barrel is constructed with 30/25 tubes. In this illustration, the tube diameters are shown in red while the interface adapters are shown in blue.

Design Example 2: Compact Finder Scope with Micromax

This assembly shows the finder scope built for an astronomical telescope. It is made by combining Micromax tubes from 25 mm to 60 mm in diameter. For this example, the optical design is simplified to use as few elements as possible. I.e., by adding one more achromat on the focusing tube would reduce curvature of field. This arrangement can be useful in an R&D lab to verify a design off the computer. While putting this together, the designer might wish to add an LED illumination for a reticule, etc. Design through play is far more creative than just staring at a computer screen.

There is an instructional video on Youtube for how this is put together: https://youtu.be/gsAN2fM_VS0

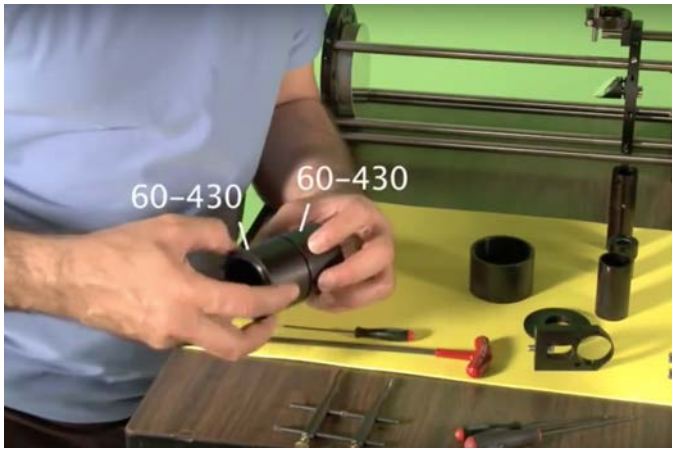




50 Ø mm front lens is held by two retaining rings 60-422

A spanner wrench is needed to secure the rings

60-430 tubes are added together for the main barrel



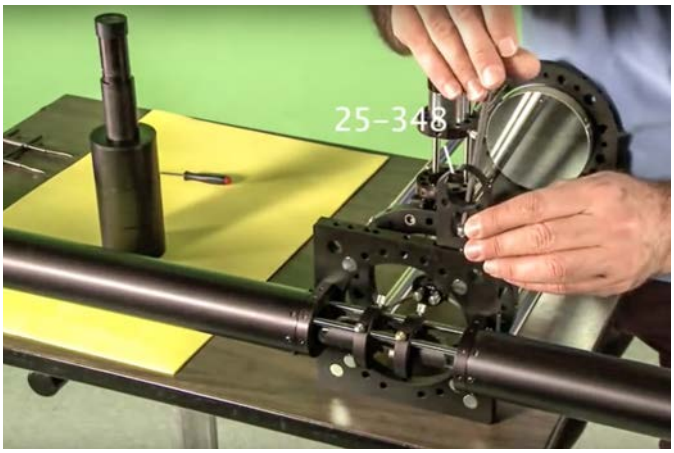
To secure the tubes, the connecting ring is held by nail

See assembly videos at our instagram page:
Optoform_Design

Download our quarterly magazine at:
www.optomechanix.org

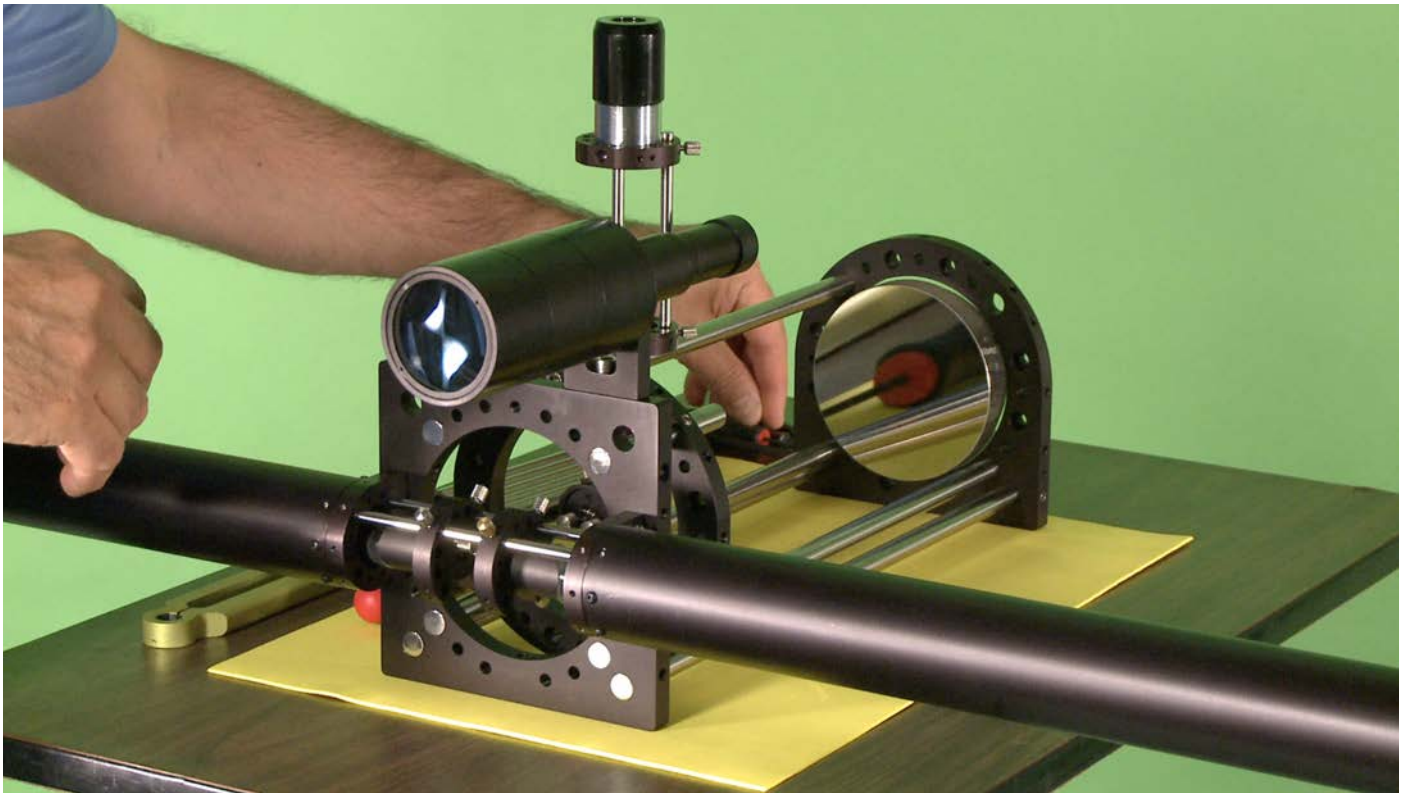
End plate 60-422 is added to one end

Tubes 30, and 25 are then added to 60-442



The finder scope could be secured in place via 25-348

The finder scope is inserted into the mounting column



This is a miniature scaled down replica of Michaelson's stellar interferometer that was mounted on Mount Willson Telescope in 1919. To see the full 2-part video, visit https://youtu.be/4II_jG7b8rM